# Automorphisms of procongruence mapping class groups

Marco Boggi

Instituto de Matemática e Estadistica,

Universidade Federal Fluminense.

Niterói - State of Rio de Janeiro, Brazil.

For $S = S_{g,n}$ a closed orientable differentiable surface of genus $g$ from which $n$ points have been removed, with $\chi(S) = 2 - 2g - n < 0$, let $\Gamma(S)$ be the mapping class group of $S$ and $\widehat{\Gamma}(S)$ and $\check{\Gamma}(S)$, respectively, its profinite and its congruence completion. The latter is the image of the natural representation $\widehat{\Gamma}(S) \to \mathrm{Out}(\widehat{\pi}_1(S))$, where $\widehat{\pi}_1(S)$ is the profinite completion of the fundamental group of the surface $S$. Let $\mathrm{Out}^{\mathbb{I}_0}(\check{\Gamma}(S))$ be the group of outer automorphisms of $\check{\Gamma}(S)$ which preserve the conjugacy class of a procyclic subgroup generated by a nonseparating Dehn twist and put $d(S) = 3g - 3 + n$. In this talk, I will discuss the theory developed in the paper [1]. The main result is that, for $d(S) > 1$, there is a natural isomorphism:

$$\mathrm{Out}^{\mathbb{I}_0}(\check{\Gamma}(S)) \cong \widehat{\mathrm{GT}},$$

where $\widehat{\mathrm{GT}}$ is the profinite Grothendieck-Teichmüller group. We will actually prove a slightly stronger result which implies that the automorphism group of the procongruence Grothendieck-Teichmüller tower is also isomorphic to $\widehat{\mathrm{GT}}$.

## References

[1] M. Boggi. *Automorphisms of procongruence mapping class groups.* `https://arxiv.org/abs/2011.15075` (2022).